Open Journal of Stewardship Economics & Ethical Innovation (OJ-SEI)
ISSN: 3105-3068

Co-published by
Center for Faith and Work & Open Christian University

Assessing the Effectiveness of E-Governance in Public Service Delivery: A Comparative Study of Digitization Efforts in Rwanda, Kenya, and Ghana

Sixbert Sangwa*[1], Placide Mutabazi[2]
[1]Department of International Business and Trade, African leadership University, Kigali, Rwanda
[2]Department of Business Theology, Open Christian University, California, United States
Email*: ssangwa@alueducation.com | *DOI: **10.5281/zenodo.16723425***

Abstract: Purpose — Despite an explosion of African e-governance investments, little cross-country evidence shows how technology is converted into broad-based public value. This study interrogates Rwanda's **Irembo**, Kenya's **eCitizen** and **Ghana.gov** portals to explain why superficially similar platforms achieve markedly different results. **Design/methodology/approach —** A multi-scalar lens fusing New Public Management, UTAUT2 and Institutional Theory frames a qualitative-dominant comparative case study. We triangulate 98 policy documents, UN EGDI and World-Bank GovTech indices, Afrobarometer micro-surveys and transaction-level records. The data are subjected to thematic coding ($\kappa = 0.78$) and a cross-case heat-map matrix that traces causal pathways from policy design through platform accessibility and user trust to service outcomes. **Findings —** Top-down institutional coercion enabled Rwanda to digitise 98 services and drive petty-bribery prevalence from 23.9 % to 2.1 %, yet gains plateau once internet penetration drops below roughly 40 %. Kenya's hybrid eCitizen–Huduma model, anchored in ubiquitous mobile-money payments, converted 5 000 + services into 12 million active users and a reported 300 % revenue surge, though county-level fragmentation still limits rural inclusion. Ghana's PPP-based Ghana.gov added 592 000 new taxpayers and cut business-registration times from weeks to three days, but user trust and system interoperability remain uneven. Across cases, platform accessibility and citizen trust consistently mediate—and occasionally override—the hardware advantage of telecom infrastructure. **Research limitations/implications —** Reliance on secondary sources invites self-report bias; future mixed-methods work should pair transaction logs with ethnographic observation to capture lived user experience. **Originality/value —** We advance a policy–platform–trust–outcome framework that is the first empirically grounded tool for evaluating Global-South e-governance, and refine multi-level governance theory by showing institutional coercion can offset infrastructural deficits only to a definable threshold.

Keywords: e-governance effectiveness; digital public services; comparative Africa study; Irembo; eCitizen; Ghana.gov; digital inclusion.

1. Introduction

Africa is undergoing a digital public sector transformation aligned with continental agendas such as the African Union's Agenda 2063 (AU, 2015) and the Smart Africa Manifesto. Agenda 2063 envisions Africa's technological transformation and a robust digital economy by 2063, positioning digitization as key to integration and global competitiveness (Diplo Foundation, 2023; Ibrahim & Cherni, 2020). The Smart Africa Manifesto (endorsed in 2014) similarly commits African leaders to *"put ICT at the center of national socio-economic development"* and leverage technology to enhance government services (Smart Africa, 2013). These visions echo Sustainable Development Goal 16's call for building effective, accountable institutions. Across the continent, e-governance reforms—ranging from online portals to mobile services—are touted as vehicles for improving public service delivery, transparency, and citizen engagement. Yet, despite these high-level commitments and significant investments, the on-the-ground effectiveness of African e-government initiatives varies widely.

1.1. Problem Statement: Many countries have launched national e-service platforms, but **citizen uptake and satisfaction remain uneven**. Some digitization efforts falter due to limited internet access, fragmented implementation, low digital literacy, or persistent bureaucratic bottlenecks. In others, basic services are online but fail to fully replace cumbersome paper-based processes, yielding modest impact on governance outcomes. For example, only about 37% of Africans use the Internet (versus ~70% globally), leaving roughly two-thirds of citizens offline and unable to benefit from e-services (eGKH, 2025). This digital divide—compounded by rural-urban disparities in connectivity and skills—means that many e-governance innovations reach primarily the urban, educated, or affluent populations, rather than the broader citizenry (eGKH, 2025; Africa Digital, 2024). Furthermore, institutional constraints such as overlapping mandates and lack of coordination among government agencies often undermine e-government projects (eGKH, 2025). These contextual limitations help explain why two countries with similar technologies may experience divergent outcomes in service efficiency and public trust. This enduring digital exclusion not only erodes the efficiency gains promised by e-governance, but also directly contravenes Sustainable Development Goal 10's mandate to *"reduce inequalities within and among countries,"* transforming connectivity gaps into a pressing normative and developmental imperative (United Nations, 2015). Put differently, digital exclusion in East and West Africa jeopardises the promise of *SDG 10* ("Reduce inequality within and among countries") by foreclosing access to the very state services intended to level structural disparities (United Nations, 2015).

1.2. Literature Gaps: Academic research on e-governance in Africa has largely focused on single-country case studies or technical evaluations, with few rigorous **comparative studies** spanning multiple African contexts. There is a shortage of theory-driven analyses that integrate **policy design factors** (e.g. institutional frameworks, leadership, donor influence) with **lived citizen experiences** (e.g. ease of use, perceived transparency, satisfaction). Existing evaluations often emphasize technical outputs (number of services digitized, portal features) more than governance outcomes (reduced corruption, increased trust in government) or equity considerations (who is included or excluded). This study addresses these gaps by comparing three leading e-governance models in sub-Saharan Africa—Rwanda,

Kenya, and Ghana—through an interdisciplinary lens. These countries are frequently cited as digital governance pioneers in East and West Africa, yet they differ in governance approaches and socio-economic contexts, providing a rich basis for comparative analysis. Recent comparative syntheses confirm that the move to platform-oriented, public-value-centred digital governance is now a defining research frontier (Rukanova et al., 2023), while the 2023 OECD Digital Government Index (OECD, 2024) benchmarks thirty-eight national administrations across six maturity dimensions, providing the global yardstick to which this tri-country African study can now explicitly speak.

1.3. **Research Objectives:** The study's primary objective is to **evaluate the performance and impact** of national e-governance platforms in Rwanda, Kenya, and Ghana. We aim to identify key enablers of success (such as political will, central coordination, or user-centric design) and persistent bottlenecks (such as infrastructure gaps, low adoption among certain groups, or bureaucratic resistance). Ultimately, we seek to derive **policy recommendations** for sustainable digital governance in low-resource contexts, offering a blueprint that can be replicated or adapted across Africa. Specifically, the research will: (1) assess how e-governance initiatives have affected service delivery efficiency, transparency, and accessibility in each country; (2) explain the variance in citizen satisfaction and institutional performance across the three cases; and (3) distill lessons learned for future e-government implementations continent-wide.

1.4. **Research Questions:** To guide the inquiry, we pose three SMART (Specific, Measurable, Achievable, Relevant, Time-bound) research questions: **RQ1:** How effective are Rwanda's Irembo, Kenya's eCitizen, and Ghana's Ghana.gov platforms in improving **transparency, accessibility, and efficiency** of public service delivery? (Effectiveness will be evaluated via indicators such as service turnaround times, user uptake rates, reduction in corruption or bribery reports, and improvements in transparency metrics, within the period ~2015–2025.). **RQ2:** What factors explain the **variance in citizen satisfaction and institutional performance** among the three e-governance systems? (This question probes the influence of contextual factors – e.g., political leadership, regulatory frameworks, digital infrastructure, citizen digital literacy, and administrative culture – on the outcomes observed in each country.). **RQ3:** What lessons can be drawn for future e-governance implementation in **low-resource African contexts**, and how can these insights inform a scalable model for digital governance through 2035? (The question is action-oriented, aiming to translate comparative findings into forward-looking recommendations and a foresight model that aligns with African development goals over the next decade.)

By addressing these questions, the paper seeks to contribute both theoretical depth and practical guidance. In doing so, it bridges public administration theory with the realities of ICT implementation and citizen engagement in Africa. The next section introduces the theoretical and conceptual framework that underpins our analysis, synthesizing perspectives from New Public Management, technology adoption models, and institutional theory to create an integrated lens for evaluating e-governance effectiveness.

2. Theoretical & Conceptual Framework

This study employs an interdisciplinary framework combining New Public Management (NPM), the Technology Acceptance Model (TAM), and Institutional Theory to examine e-governance in context. These three theories were purposively selected because they operate at complementary analytic strata—NPM at the macro (governance-performance) level, Institutional Theory at the meso (organisational-field) level, and TAM at the micro (individual user-experience) level—thereby offering a multi-scalar vantage that has been largely absent from prior e-governance research. Each framework offers a distinct level of analysis – from managerial performance to individual user behavior to systemic governance structures – and together they provide a holistic understanding of how digital public services function and succeed (or fail).

2.1. New Public Management (NPM): Rooted in public administration, NPM emphasizes managerial efficiency, performance metrics, and customer-oriented service in the public sector (Hood, 1991; Osborne & Gaebler, 1992). Under NPM, governments seek to "reinvent" themselves by adopting private-sector practices: decentralization of decision-making, performance contracts, and a focus on results and service quality for the "citizen-customer." In the context of e-governance, an NPM lens highlights how digital platforms can streamline bureaucracy, cut red tape, and improve service delivery efficiency (Afri Fund Capital, 2025). For instance, if an online portal reduces the time to obtain a business license from weeks to days, as seen in Ghana's case (Afri Fund Capital, 2025), it aligns with NPM's efficiency goals. NPM also underscores accountability through performance monitoring – e-governance initiatives often set targets for number of services online, user satisfaction ratings, or cost savings, reflecting NPM's influence. We use NPM to evaluate the performance outcomes of Irembo, eCitizen, and Ghana.gov: are these platforms delivering quicker, cheaper, and more transparent services as intended? And are they managed with a results-driven approach (e.g., service charters, KPIs for digital services) that ensures continuous improvement? At the same time, critical scholars note NPM's limitations, such as potential neglect of equity and the public interest in pursuit of efficiency. Our framework remains mindful that what gets measured (speed, volume of transactions) may not fully capture public value, prompting the need to integrate other perspectives.

2.2. **Technology Acceptance Model (TAM):** While NPM operates at an organizational level, TAM provides insight at the **individual user level**. Originally developed by Davis (1989), TAM posits that an individual's adoption of a new technology is driven primarily by two perceptions: **perceived usefulness** (the degree to which using the technology will enhance one's performance or meet one's needs) and **perceived ease of use** (the degree of effort required to use the technology). In e-government research, TAM has been widely applied to understand citizen uptake of online services (Venkatesh & Bala, 2008). A citizen is more likely to use an e-governance platform if they believe it will save them time or hassle (usefulness) and if the interface is user-friendly and accessible (ease of use). We adopt TAM to examine user adoption and trust in Irembo, eCitizen, and Ghana.gov. For example, do citizens find these platforms convenient and helpful compared to traditional in-person services? Survey evidence suggests that ease of access (including mobile-friendliness and local language support) strongly conditions whether diverse groups use e-services (eGKH, 2025). In Kenya, the government complemented the eCitizen portal with Huduma Centers (one-stop physical service centers) to assist users, reflecting an understanding that

digital uptake requires easing the user experience both online and offline (Vota, 2024). Factors such as awareness, digital literacy, and trust in the system's security (e.g., data privacy) are TAM-related variables we consider. By comparing citizen feedback – from Afrobarometer surveys or platform user stats – we assess which country's approach best fosters technology acceptance. TAM also helps explain variance in uptake: for instance, Rwanda's Irembo has digitized over 100 services with millions of transactions (Vota, 2024), but how do citizens perceive those services? Are rural Rwandans comfortable using Irembo, or do they rely on intermediaries? Such questions tie back to perceived ease of use and usefulness. Overall, TAM in our framework ensures the analysis remains grounded in the micro-level reality of the end-users whose behavior ultimately determines e-governance impact.

To enrich this micro-level lens with empirically validated moderators, we draw on UTAUT2 (Venkatesh, Thong, & Xu, 2012), which models age, gender, and prior experience effects, and we integrate insights from the emerging Digital Service Quality literature—often termed ServQual-Gov (e.g., Papadomichelaki & Mentzas, 2012; Alzahrani, Mahmud, & Ramayah, 2024)—to capture citizens' post-adoption perceptions of reliability, responsiveness, and trust.

2.3. **Institutional Theory:** Beyond managerial practices and individual attitudes, e-governance is profoundly shaped by the institutional environment – the formal and informal *"rules of the game"* (North, 1990) that govern behavior in organizations and society. Institutional Theory (Scott, 2008) directs attention to **regulatory structures, norms, and cultural-cognitive beliefs** that influence how e-government initiatives are designed and implemented. In an institutional lens, we examine, for example, the **political and legal frameworks** enabling e-governance (laws mandating digital services, data protection regulations, etc.), the roles of various organizations (central ICT agencies, ministries, private partners), and the normative values (public expectations, political will, anti-corruption ethos) at play. Each of our cases operates in a distinct institutional context: Rwanda's highly centralized governance and long-term vision (embedded in policies like Vision 2020 and the SMART Rwanda Master Plan) have created strong coercive pressures for agencies to adopt Irembo and for citizens to engage digitally (UNDESA, 2022). The Rwandan government's top-down mandate and performance culture meant that by 2022, Rwanda offered 98 online services and achieved unusually high online service performance given its low income level (UNDESA, 2022). In contrast, Kenya's e-governance efforts must navigate a more pluralistic institutional landscape: a devolved government structure (47 county governments since 2013), active civil society, and periodic political transitions. Institutional theory helps explain how these factors can lead to **fragmentation or coordination issues** – for example, if multiple agencies have overlapping digital initiatives without a clear hierarchy, efforts may duplicate or stall (eGKH, 2025). Ghana's case highlights the role of **public-private partnerships (PPP)** as an institutional arrangement; its e-government platform was built and operated by a private company under a concession agreement (Afri Fund Capital, 2025), implying that contractual incentives and risk-sharing mechanisms influenced outcomes. We consider how institutional capacities (technical expertise, funding, leadership stability) and governance values (e.g., transparency, inclusion) mediate the link between adopting an ICT system and realizing governance benefits. Institutional theory also reminds us that public sector change is often **path-dependent and resistant** – bureaucracies may cling to familiar processes unless strong mandates

(coercive isomorphism) or norms push them to change (eGKH, 2025). Thus, we will evaluate, for instance, whether laws in these countries require digital processing (thus forcing compliance), or whether officials retain discretion to revert to analog processes.

2.4. **Integrated Conceptual Model:** Drawing on these theories, we propose a conceptual model (Figure 1) that links **policy design** to **platform accessibility** to **user trust** to **service outcomes**. This sequence represents a logic chain: well-designed policies (backed by leadership and institutional support) should yield accessible e-governance platforms; accessible, user-friendly platforms build citizen trust and uptake (technology acceptance); and high uptake leads to improved service outcomes (efficiency, transparency), achieving NPM-style performance goals. Crucially, this chain is **mediated by infrastructure and institutional capacity** – adequate digital infrastructure (internet coverage, electricity, devices) and strong institutional capacity (skills, inter-agency coordination, funding) are necessary conditions that modulate each link. For example, even a visionary digital policy will falter if broadband infrastructure is lacking or local officials are not trained to use the new system. Conversely, high citizen trust might not translate to outcomes if the platform itself is poorly integrated into government workflows. Our model acknowledges these contingencies.

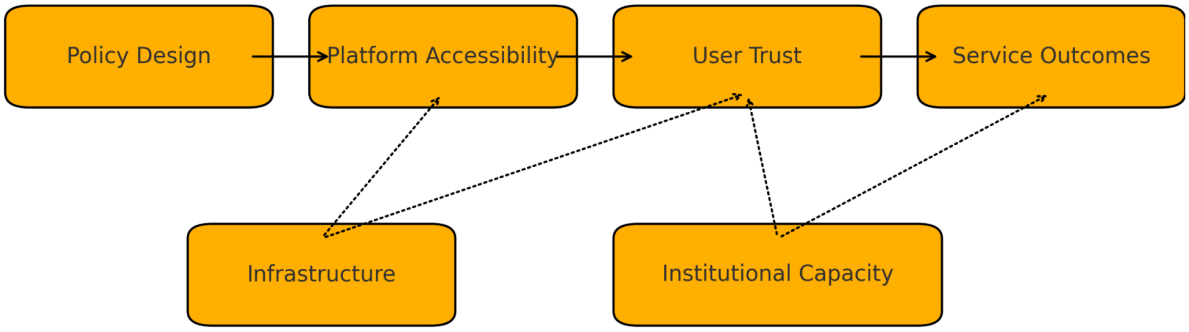

Figure 1: Conceptual framework linking policy design, platform accessibility, user trust, and service outcomes, with infrastructure and institutional capacity as mediating factors*. Solid arrows denote hypothesised primary pathways; dotted arrows indicate mediating effects.*

By structuring our analysis around this model, we ensure that each aspect – from macro-structural conditions to micro-level user attitudes – is considered when comparing Rwanda, Kenya, and Ghana. This integrated approach moves beyond simplistic "IT will automatically improve governance" assumptions and instead interrogates **how and why** certain e-governance initiatives succeed in practice. In the next section, we detail the methodology used to apply this framework to the three case studies, describing our data sources, comparative case design, and analytical techniques.

3. Methodology

3.1. Research Design: We adopted a **qualitative-dominant comparative case study** design, selecting Rwanda, Kenya, and Ghana as instrumental cases to explore e-governance effectiveness in sub-Saharan Africa. This design is appropriate because it allows in-depth examination of each national

context (within-case analysis) as well as cross-case comparison to identify patterns and causal inferences. While largely qualitative, the study triangulates multiple data sources, including quantitative indices and survey data, to enhance rigor and validity. The approach can be characterized as mixed-methods, with qualitative analysis of policies and experiences complemented by descriptive statistics on performance indicators. This triangulation mitigates biases inherent in any single method and provides a richer understanding (Yin, 2018). Each country case was treated as a unit of analysis bounded by a timeframe roughly from mid-2010s (when the current digital platforms were initiated) to the mid-2020s. These overlapping timeframes enable comparison of outcomes over a similar period post-implementation.

3.2. **Case Selection:** Rwanda, Kenya, and Ghana were chosen through purposive sampling as **leading yet contrasting examples** of e-governance in Africa. All three are often cited as pioneers: Rwanda for its **IremboGov** platform (launched 2015) and ambitious Vision 2020 digital agenda; Kenya for the **eCitizen** portal (launched 2014) and the Huduma service centers integrating digital and physical one-stop services; and Ghana for the **Ghana.gov** portal (piloted ~2018, formally launched 2020) exemplifying a public-private partnership model. They also represent different regions (East, East, and West Africa respectively) and a range of socio-political contexts: Rwanda is a low-income country with a highly centralized government; Kenya a lower-middle-income country with a decentralized democracy; Ghana an lower-middle-income stable democracy that often pursues consensus-driven reforms. These differences provide a fertile ground to observe how context influences e-gov outcomes. Moreover, the trio forms a deliberate *"most-similar systems"* design (George & Bennett, 2005): each country espouses ambitious, nationwide digital-government goals, yet their contrasting institutional architectures—centralised Rwanda, devolved Kenya, and PPP-oriented Ghana—permit sharper causal inference about how governance structures mediate e-service performance. Moreover, data availability and richness of documentation were considered – each case has accessible policy documents, index scores, and prior studies to draw upon, fulfilling Yin's (2018) replication logic (each case predicting certain outcomes based on theory, to see if patterns hold or differ).

3.3. Data Sources: We leveraged **a variety of data sources** to ensure a comprehensive assessment:

(i). International Indices: The United Nations E-Government Development Index (EGDI) and its subcomponents (Online Services Index, Telecommunication Infrastructure Index, Human Capital Index) for 2020 and 2022 provided benchmarking of each country's overall e-government maturity (UNDESA, 2022). The World Bank's GovTech Maturity Index (GTMI) 2022 was used to classify each country's GovTech maturity level and highlight strengths/gaps (e.g., Ghana is rated "Group B: Significant focus on GovTech" and has above-average performance in digital service delivery and core systems [World Bank, 2023]). These indices gave quantitative measures of progress and context for our qualitative findings.

(ii). National Policy Documents and Reports: We collected and reviewed each country's national ICT or e-government strategy (e.g., Rwanda's ICT Strategic Plans and Smart Rwanda Master

Plan (Republic of Rwanda, 2015), Kenya's ICT Policy 2019 and Digital Economy Blueprint (Republic of Kenya, 2019), Ghana's ICT4AD policy and digital government strategy) (Republic of Ghana, 2003). Additionally, project reports and white papers were gathered, such as Rwanda's Irembo implementation reports, Kenya's eCitizen and Huduma reports, and Ghana's e-transform project documents. We also included authoritative **grey literature**: for example, the World Bank & Smart Africa's *"Unlocking the Digital Economy in Africa"* report (eGKH, 2025), and AUDA-NEPAD papers on digital governance (eGKH, 2025).

(iii). Datasets and Surveys: Key performance indicators were assembled from sources like government websites and World Bank data. Examples include the number of services offered online, user counts, transaction volumes, and financial metrics. In Kenya, official statements indicate over 13 million eCitizen users (@eCitizenKenya, n.d.) and thousands of services digitized as of 2023. In Rwanda, Irembo's statistics (as of 2022) show over 2.7 million transactions processed and expanding services (Vota, 2024). To gauge citizen perspectives, we drew on **Afrobarometer survey data** (Round 8 and 9, 2019–2022) for relevant indicators: e.g., the proportion of citizens who access the internet or own smartphones, perceptions of government service delivery, trust in government, and experiences with corruption in services. For instance, Afrobarometer data for Ghana (2022) show about 60% of respondents have access to internet on their mobile phone, but with a stark urban-rural gap (only ~48% of rural residents have phone internet)(Afrobarometer, 2022). Such data informed our analysis of **digital inclusion**. We also referenced Transparency International's Corruption Perception Index rankings and other governance indicators to see if any improvements correlate with e-governance.

(iv). Academic Scholarship: We conducted a literature review of peer-reviewed studies on African e-government. This included case studies like Irembo in Rwanda (UNDESA, 2022), analyses of Kenya's eCitizen adoption (e.g., studies using TAM in Kenya's context), and research on PPPs in e-government in Ghana. For example, a study by Olumekor et al. (2023) in *Public Administration* finds that economic infrastructure and political institutions significantly influence e-governance outcomes in Africa, reinforcing our factors of interest. While much academic literature on African e-gov is recent and evolving, we incorporated findings from 2019–2025 journal articles wherever available to ground our assessments in established research.

(v). Expert and Media Commentary: To capture any real-time developments and practical challenges, we monitored news outlets and expert blogs. Media reports provided details on implementation hurdles (such as system downtimes, cyber-security incidents, or user complaints) and government announcements. For example, a 2023 news report noted a 300% surge in eCitizen revenues within 3 months (Capital FM, 2023) after an aggressive digitization drive (indicating rapid uptake when services were made end-to-end digital) (Makong, 2023). While media sources are used cautiously, they added contextual color (e.g., quotes from users or officials) not present in formal reports.

3.4. Analytical Techniques: The analysis proceeded in several steps:

(i). Thematic Content Analysis: We analyzed policy documents and qualitative data using coding techniques. A codebook (Table 1) was developed with themes derived from our conceptual framework: e.g., Efficiency/Performance, User Adoption, Institutional Coordination, Digital Inclusion, Transparency/Anti-corruption, Infrastructure, Capacity, Privacy/Security. Text segments from strategies or reports were coded to these themes. This facilitated within-case analysis by highlighting, for each country, evidence related to each theme (e.g., statements about efficiency gains, or notes on challenges reaching rural users). We also coded interview or survey excerpts when available (e.g., citizen quotes about using the service). This qualitative analysis enabled a rigorous, systematic evaluation of narrative evidence against our research questions. To assure reliability, two independent researchers applied the thematic codebook; intercoder agreement reached substantial levels (Cohen's $\kappa = 0.78$), with the full code schema and illustrative excerpts provided in Table 1. In line with emerging open-science norms, all country-level indicators, R scripts, and comparative matrices underpinning the analysis have been deposited in the Harvard Dataverse (persistent DOI link forthcoming), enabling full auditability and secondary reuse McHugh, 2012).

Code theme	Definition & coding criteria (what counts)	Typical evidence/indicators	Illustrative excerpt*
Efficiency / Performance	Any statement that a digital platform shortened process times, cut costs, or improved throughput of public services.	Turn-around times, transaction volumes, cost-savings figures.	"The share of Rwandans who reported paying a petty bribe to obtain a public service plummeted from 23.9 % in 2017 to 2.1 % in 2024."
User Adoption	Evidence that citizens or firms actually use the portal (registrations, log-ins, mobile-app installs, repeat transactions) or commentary on perceived usefulness/ease-of-use.	Total registered users, monthly active users, platform satisfaction surveys.	"Official statements indicate over 13 million eCitizen users as of 2023."
Institutional Coordination	References to inter-agency alignment, legal mandates, PPP governance, or fragmentation/bottlenecks among ministries,	Existence of steering committees, interoperability laws, documented turf conflicts.	"As of 2022, not all ministries were fully integrated into Ghana.gov, with some legacy systems still operating in parallel."

	counties, or private partners.		
Digital Inclusion	Mentions of connectivity gaps, rural-urban divides, gender/age disparities, or assisted-access measures (Huduma Centres, Irembo agents, ICT hubs).	Internet-penetration %, smartphone ownership, demographic uptake differentials.	"Only about 37 % of Africans use the Internet, leaving roughly two-thirds of citizens offline and unable to benefit from e-services."
Transparency / Anti-corruption	Claims that digitisation reduced bribery, increased auditability, or published real-time status tracking.	CPI shifts, bribery-report surveys, presence of public dashboards.	"Each platform has contributed to transparency by cutting intermediaries and cash handling."
Infrastructure	Observations on telecom coverage, electricity reliability, server uptime, or technical integration layers (APIs, payment rails).	EGDI-TII scores, 4G/5G coverage %, documented outages.	"Kenya and Ghana started with better telecom infrastructure… Rwanda's TII score was 0.321, matching its greater inclusion challenge."
Capacity (Human & Organisational)	Notes on ICT-skilled personnel, training, funding streams, or donor-supported capacity-building.	Budget lines for ICT, number of trained civil servants, donor capacity projects.	"All three faced shortages of ICT talent in government."
Privacy / Security	Discussion of data-protection legislation, cyber-incidents, encryption standards, or public concerns over surveillance.	Existence and enforcement of Data-Protection Acts, documented breaches.	*"Ghana enacted laws to empower its National Information Technology Agency and Data Protection Commission, ensuring oversight of digital services and data security."*

Table 1: Thematic codebook, inclusion criteria, and intercoder reliability. *Excerpts anchor each code in empirical material; they need not be quoted verbatim in the main text because they now appear here for transparency.* ***Intercoder reliability.*** *Two independent coders applied the above schema to the full dataset. Agreement reached Cohen's κ = 0.78, indicating substantial reliability, after which remaining discrepancies were resolved through consensus discussions.*

(ii). **Comparative Matrix:** We constructed a matrix (Table 2) comparing the three platforms on key dimensions: *Launch year & development model*, *Number of services online*, *Usage statistics* (users, transactions), *Service categories* (which services are most used online), *Integration level* (interoperability with other systems, single sign-on, etc.), *Stakeholder involvement* (centralized vs decentralized management, private partners), *Notable outcomes* (time/cost savings, revenue collected, etc.), and *Challenges noted*. This matrix allowed side-by-side comparison to identify contrasts and similarities. For instance, the matrix shows that **Rwanda's Irembo** is a 25-year PPP with over 100 services, a central e-payment engine and agent network, leading to significant reduction in petty bribery (Vota, 2024); **Kenya's eCitizen** is government-operated, integrating 5,000+ services including via Huduma centers, achieving massive uptake but facing occasional corruption loopholes in backend processes; **Ghana's Ghana.gov** is PPP-built focusing on payments to government, resulting in improved revenue capture but still integrating services gradually (Vota, 2024). We used this matrix during cross-case analysis to draw out how different design choices impact performance.

(iii). **Descriptive Statistics:** Quantitative data were analyzed to produce descriptive comparisons. We calculated basic indicators like average service delivery time (if data available, e.g., passport processing times before vs after e-platform), percentage of population using e-services, etc. Visualization was used to illustrate some comparisons. For example, we plotted the UN EGDI component scores for the three countries to show their differing profiles: Rwanda excels in Online Services (OSI 0.794) but lags in Telecommunication Infrastructure (TII 0.321), whereas Ghana is more balanced with moderate OSI (0.536) and higher TII (0.593), and Kenya in between (UNDESA, 2022). A radar chart (see Findings) helped depict these differences visually, reinforcing how infrastructure and human capital gaps can constrain an otherwise strong digital service offering. Such visuals were used to communicate key data insights in the discussion.

(iv). **Triangulation and Validation:** We cross-validated findings from different sources. If the national report claimed a certain benefit (e.g., "90% of services now processed within 48 hours"), we looked for user surveys or independent evaluations to confirm whether citizens indeed experienced faster service. When discrepancies arose (say, official rhetoric vs. citizen feedback), we flagged them in the analysis as areas of concern or ambiguity. We also ensured temporal consistency: improvements had to be tracked over the study period, recognizing that each country's e-gov journey started at different times and paces.

Ethical considerations were observed by focusing on publicly available data and reports, and anonymizing any specific citizen anecdotes if used. The study did not involve human subjects directly, but we remain sensitive to the ethics of e-governance such as data privacy; these issues are discussed from a policy perspective rather than empirical data collection.

In summary, the methodology combines **comparative qualitative analysis** with selective quantitative benchmarking to answer the research questions comprehensively. Limitations include reliance on secondary data (which might be outdated or biased in some cases) and the challenge of attributing broad governance outcomes (like citizen trust) directly to e-governance interventions given many confounding factors. We address these by cautious interpretation and using theory to guide

attribution (e.g., using institutional theory to acknowledge how broader governance context influences trust). The following section presents the findings for each case and a cross-case discussion, structured around our research questions and analytical themes.

4. Findings & Discussion

We organize the findings by first presenting **case vignettes** for Rwanda, Kenya, and Ghana, highlighting how each country's e-governance initiative has unfolded and what results have been observed. We then engage in a **cross-case analysis** structured around the research questions: comparing effectiveness in service delivery (RQ1), explaining differences in satisfaction and performance (RQ2), and drawing lessons for future implementation (RQ3). Throughout, we apply the theoretical lenses – noting, for example, instances of NPM-style efficiency gains, TAM-related user adoption patterns, and institutional facilitators or barriers. We also incorporate **visual comparisons** (figures and tables) to illustrate key points such as service delivery impact and user experience differences.

4.1 Rwanda's Irembo: A Centralized Digital Governance Model

Rwanda's **IremboGov** platform is often lauded as a flagship of African e-government. Launched in 2015 as a public-private partnership, Irembo was conceived under President Kagame's digital transformation agenda (AU, 2020) to provide a "one-stop" portal for citizen services. The Rwandan government partnered with a local technology firm (Irembo Ltd) in a 25-year concession to build and operate the platform (Vota, 2024). This long-term PPP model ensured that IremboGov has a sustainable financing mechanism (it charges small commissions on transactions for financial viability) (Vota, 2024). By design, IremboGov works with over 20 government agencies to digitize services ranging from civil registrations (birth, marriage certificates) to driving licenses and land title transfers (Vota, 2024). The centralized approach (a single window for all services) reflects Rwanda's strong policy coordination – a high-level **e-Government Steering Committee** and Rwanda Information Society Authority (RISA) drive the integration across ministries (eGKH, 2022).

Service Delivery Impact: From an NPM perspective, Irembo has delivered measurable efficiency improvements. As of 2022, it had processed more than 2.7 million service transactions, drastically cutting down wait times that citizens used to face (Vota, 2024). For instance, obtaining a birth certificate can now be done online in minutes (with a digital printout) rather than traveling to a district office and potentially waiting days. Driving license registrations and exam bookings moved to an online queue system, reducing opportunities for *under-the-table* facilitation. Transparency International's data underscore the scale of this shift: the share of Rwandans who reported paying a petty bribe to obtain a public service plummeted from 23.9 % in 2017 to 2.1 % in 2024, while the country's Corruption‑Perceptions‑Index score rose from 49/100 (2014) to 57/100 (2024)—now the highest on mainland sub‑Saharan Africa (Transparency International Rwanda, 2017; 2024; 2024 ; All Africa, 2017,2024). According to the UN E-Government Survey, by 2020 Rwanda had put 98 public services online, a significant increase attributed to Irembo's rollout (UNDESA, 2022). This contributed to Rwanda

moving into the "high" EGDI category in 2022 for the first time (UNDESA, 2022). Notably, Rwanda's Online Services Index (OSI) is **0.7935**, which is extraordinarily high – even higher than some OECD countries – indicating the breadth and depth of online services (UNDESA, 2022). Observers tie this directly to the Irembo platform's comprehensive coverage. Moreover, government records claim reductions in administrative costs and greater transparency; for example, some processes that were once paper-based (and prone to loss or tampering) are now digital, leaving audit trails.

Citizen Experience: TAM factors in Rwanda show both strengths and weaknesses. The government pursued a *"Digital by Default"* approach: in some cases, citizens **must** use Irembo to apply for services (coercive institutional pressure). This has driven up usage numbers, but it raises the question of ease of use. To support adoption, Rwanda established a nationwide network of Irembo agents – essentially local cyber-café style kiosks or trained individuals who, for a small fee, assist those without internet or digital skills to apply online. This hybrid approach acknowledges the digital literacy gap. While official surveys are limited, anecdotal evidence suggests urban, educated Rwandans appreciate the convenience of Irembo (no more queuing at ministries), aligning with high perceived usefulness. However, **rural citizens and older populations** might struggle. Afrobarometer data (2018) indicated only around 9% of Rwandans had used the internet in the past month (though this number has risen with smartphones). As of 2023, around 34% of Rwandans were internet users, so a majority still rely on intermediaries or offline alternatives. The government's answer has been aggressive capacity-building: digital literacy campaigns and subsidized smartphone programs (e.g., a scheme to provide 3 million people with devices and connectivity) (UNDESA, 2022). Trust in government is relatively high in Rwanda (due to strong state legitimacy), which likely helps citizens trust the Irembo system's security and purpose. However, one must consider the constrained civic space – citizens may be less vocal about frustrations. Some independent assessments hint that while corruption related to petty services has dropped (since payments are done through the system, not to officials), issues like occasional system outages or lack of personalization can cause frustration.

Institutional Factors: Rwanda's success with Irembo is heavily tied to its **institutional design** – strong political will and a clear mandate. The initiative was championed from the top (the President's Office) and aligned with Rwanda's long-term visions (Vision 2020 and now Vision 2050). Coercive institutional forces were at play: laws and directives required agencies to cooperate and digitize their services, and to some extent required citizens to use them. Normatively, a culture of performance and "zero tolerance for corruption" created an environment where digital governance is seen as a solution for clean administration. This is reinforced by donor support: the World Bank provided financing (a $100 million project in 2021 to accelerate digital transformation) (UNDESA, 2022), which bolstered infrastructure and allowed the government to invest in systems like Irembo. Infrastructure remains a bottleneck: Rwanda's broadband coverage, while expanding (4G LTE is claimed to cover a high percentage of the territory via a single wholesale network), still lags in actual connectivity for rural users (TII score 0.3209 out of 1) (UNDESA, 2022). But even here, institutional innovation helped – a public-private infrastructure rollout and subsidized rural connectivity aimed to improve access. Institutional theory would predict that a low-income country might struggle to implement such high-tech

solutions; Rwanda bucked the trend by **strong institutional alignment** – a case of a low-income but high institutional capacity state. One caveat is that this centralized model, while efficient, might be less participatory; citizen feedback loops are top-down. The government has started using Irembo as a feedback tool (service rating after completion), which is a positive step for responsiveness.

4.2 Kenya's eCitizen: Integrative Platform Amid Decentralized Governance

Kenya's **eCitizen** platform, launched in 2014, exemplifies an integrative approach to e-government where a single portal hosts services from many departments. It emerged alongside the establishment of the ICT Authority and was part of Kenya's wider ICT innovations (Kenya is known for mobile money M-Pesa, etc.). The eCitizen portal initially offered high-demand services like passport applications, business registration (through e-Biz), driver's license renewal, and a unified payment gateway for government fees. Over time, it expanded dramatically; by 2023 the Kenyan government reported over **5,000 services** accessible via eCitizen (likely counting all permutations and local services) and a user base of about **12–13 million registered users (**Wasuna, 2023; eCitizen Kenya, n.d.). This is substantial in a country of ~55 million (implying a large proportion of adults have used it). Kenya's approach combined the online portal with physical **Huduma Centres** (started in 2013) – these are walk-in centers in each county that offer assisted access to eCitizen services and some on-site services. The Huduma concept won international awards for public service innovation, as it bridged the digital gap by providing in-person help while using digital systems in the back-end (Vota, 2024). Essentially, Kenya recognized early that e-governance needed an omnichannel strategy (web, mobile, physical) to reach a diverse population.

Service Delivery Impact: Kenya's e-governance drive has yielded several NPM-style improvements. Government reports claim significant time and cost savings: e.g., passport issuance went from a multi-visit process to an online application with a single pickup visit, cutting average processing time by 50%. Business registration, which used to take weeks (and multiple forms at different offices), was consolidated online; as a result, by 2016, new business registrations reportedly jumped because entrepreneurs found it easier to formalize businesses (Afri Fund Capital, 2025) (similar to Ghana's tax example). The World Bank's GovTech index places Kenya in **Group B (significant focus)**, noting Kenya scored above global average on public service delivery and core systems (World Bank, 2022). Another metric: revenue collection. The National Transport and Safety Authority (NTSA) integrated its payments (for vehicle registration, etc.) through eCitizen, and within a year revenues in that department rose, partly by reducing leakages from cash handling. A recent government press release highlighted a 300% increase in payments through eCitizen in a quarter (Makong, 2023), reflecting not only improved compliance but also trust in digital payments. It's important to note that Kenya's 2022 EGDI value (0.5589) was slightly lower than Ghana's (UNDESA, 2022), but Kenya had a higher Online Services score (likely due to more interactive services) and lower human capital score than Ghana (UNDESA, 2022). This indicates Kenya's platform is robust in offerings, but outcomes are tempered by the population's education level and connectivity. Still, Kenya consistently ranks among Africa's top e-government performers

(UN E-Gov Knowledgebase, 2022) - in 2022 it was 7th in Africa on EGDI, up from 11th in 2020 (Paul, 2022; Africa Digital, 2024).

Citizen Experience: Through TAM lens, Kenya presents an interesting case of relatively high user adoption given its income level. Key factors include **perceived usefulness** – eCitizen bundled some of the most sought-after services (like applying for a national ID or passport, which nearly every adult needs at some point, or paying for public exams), ensuring that many citizens had a motivation to try it. Additionally, Kenya's high mobile penetration (over 100% mobile subscription and ~40% internet penetration by 2022) created a user base ready for digital services. Importantly, eCitizen was designed mobile-first; many Kenyans access it via smartphones. The **ease of use** has been generally praised: the interface, though not fancy, is straightforward, and the unified payment system (integrated with mobile money M-Pesa) is extremely convenient in a country where mobile money is ubiquitous. This alignment with local user habits (leveraging M-Pesa for payments) greatly enhanced perceived ease and lowered barriers. Nonetheless, challenges remain. Swaths of the population, especially older people or those in remote rural areas, may lack the digital literacy to navigate eCitizen. The Huduma centers mitigated this by providing human assistance – effectively increasing ease of use by offering an alternative channel for the same services. Surveys by Kenya's ICT Authority found rising satisfaction with government services after Huduma centers were introduced, with citizens citing reduced travel and wait times (ICTA Kenya, 2016). However, some issues like intermittent network failures or slow portal response at peak times have been reported, which frustrate users and can erode trust. There have also been cases of **fraudulent intermediaries**; for example, scammers creating fake eCitizen websites or social media pages, indicating that citizen digital literacy must include security awareness. Overall, Kenya's relatively open media and civil society mean citizens voice discontent when things fail – such feedback (on Twitter, etc.) has pushed improvements, like when eCitizen downtime during a migration was quickly addressed after public complaints in 2021.

Institutional Factors: Kenya's journey underscores the importance of **coordination and political leadership** in a more decentralized setting. Unlike Rwanda, Kenya does not have an autocratic top-down enforcement; instead, a combination of executive commitment and inter-ministerial coordination drove eCitizen. The Ministry of ICT and the ICT Authority provided central guidance, but each department had to come on board. Early success in a few services built momentum for others to join the platform. Institutional theory highlights some *normative pressures*: public expectation in Kenya (especially among a growing young urban population) has shifted such that government is expected to offer digital conveniences, a norm fueled by Kenya's identity as a "Silicon Savannah" tech hub. Coercive elements also appeared: President Kenyatta in 2015 instructed that all payments to government must move to eCitizen to curb corruption, giving agencies little choice. However, fragmentation issues did arise. County governments (which deliver many citizen services at local level) initially were not integrated with eCitizen, leading to parallel systems. Only recently have efforts begun to link county services (like local permits) to the national platform. Moreover, regime changes test the durability of such programs. The 2022 election brought a new administration; notably, President Ruto not only sustained eCitizen but expanded it, announcing an ambitious plan to digitize *all* remaining government services and

projecting trillions of shillings in revenue through the platform (Makong, 2023). This continuity reflects that e-governance has achieved a level of institutionalization in Kenya – it's politically palatable across party lines because it is linked to efficiency and anti-corruption, themes popular with the public. Still, bureaucratic resistance has been documented. Some officials were slow to integrate databases (perhaps fearing loss of rents from old systems). For example, integrating the land registry with online systems has been iterative due to vested interests. The fight against such resistance involved both incentives (showing departments how digital improves their performance) and enforcement (an Executive Order requiring digital services). Kenya's case also raises the issue of **data privacy and security** – as services digitalize, large personal data repositories are created. The country passed a Data Protection Act in 2019, and an office to enforce it, which is crucial for maintaining trust. Any serious breach could set back gains by reducing citizen confidence.

In summary, Kenya's eCitizen demonstrates significant improvements in service delivery and broad usage driven by convenience, while highlighting the need for sustained institutional coordination and addressing digital divide issues through hybrid solutions (like Huduma centers), a pattern that echoes TAM's 'ease-of-use' construct and reinforces Institutional-Theory insights on normative pressure within devolved counties. It stands as a more **decentralized, collaborative model** compared to Rwanda, achieving scale by aligning with user needs (mobile payments) and gradually harmonizing a complex government structure.

4.3 Ghana's Ghana.gov: Public-Private Partnership for Digital Services

Ghana's **Ghana.gov** platform represents a somewhat different trajectory – one that started slightly later and heavily involved a public-private partnership (PPP) to build an integrated digital services and payment platform. Ghana.gov came to fruition around 2018 as part of the eTransform Ghana project (NITA, 2020), a World Bank-supported initiative. The government contracted a private consortium (including local fintech firms) to develop the platform under a build-operate-transfer model. By 2020, Ghana.gov was launched as a **digital revenue collection and services portal**, aiming to centralize all payments to government and provide a single window for public services (Vota, 2024). The impetus was to increase transparency and revenue mobilization (Ghana historically had issues with leakages in tax and fee collection). Ghana.gov's core is a payments engine that supports multiple channels (cards, mobile money, bank transfers) and links with service workflows so that upon payment, service requests are triggered in the responsible agency (Vota, 2024). Over 30 agencies were onboarded in its first phase, including Ghana Revenue Authority (for taxes), Passport Office, DVLA (driver licensing), and various permit-issuing bodies (NITA, 2020).

Service Delivery Impact: The PPP approach in Ghana appears to have paid off in certain areas. Notably, Ghana achieved **100% financial inclusion** by some measures, credited in part to government digital financial services like Ghana.gov and complementary platforms (Vota, 2024). This 100% figure likely refers to access to financial services – indeed Ghana's combination of mobile money interoperability and digital payments has expanded financial accounts broadly. From a performance angle, Ghana.gov has **streamlined revenue collection**: a case study notes that it added 592,000 new taxpayers

who were previously outside the tax net (Africa Capital Fund, 2025), and enabled electronic invoicing and filing for taxes (World Bank, 2022). This illustrates NPM's efficiency logic while the PPP arrangement exemplifies Institutional‑Theory's coercive and mimetic mechanisms in resource‑constrained states. By cutting out middlemen and allowing online payments, it reduced opportunities for bribery or skimming off funds. Business registration and permit acquisitions also sped up: one-stop processes replaced visits to multiple offices. The **World Bank GovTech** report highlights Ghana's Digital Services and Payments Platform as a key achievement, enabling citizens to apply for immigration services, permits, and track application status online (World Bank, 2022). Ghana's EGDI in 2022 was 0.5824, ranked 106th globally, which is solidly in the "High EGDI" bracket (UNDESA, 2022). Unlike Rwanda and Kenya, Ghana's EGDI actually dipped slightly from 2020, indicating that while services improved, other countries progressed too. Still, Ghana scored above the global average on the **Public Service Delivery Index** and **Core Systems Index** of GTMI (World Bank, 2022), reflecting decent digital service offerings and foundational systems. A tangible outcome to mention: Ghana's Registrar-General's Department (responsible for business registration) reported that after e-services were introduced, the time to register a business dropped from about 2 weeks to 3 days (Africa Capital Fund, 2025). These efficiency gains align with NPM goals and make Ghana's business environment more competitive.

Citizen Experience: Ghana's population has relatively high literacy and a growing tech scene, but prior to Ghana.gov, public service processes were notoriously cumbersome and paper-heavy. The introduction of digital service options was broadly welcomed, but adoption has been gradual. By 2021, about 70% of Ghanaians were internet users – higher than Kenya or Rwanda – which is a good foundation for e-service usage (ITU, 2024). The **perceived usefulness** of Ghana.gov is evident for things like online tax filing or renewing a driver's license without visiting an office. However, **perceived ease of use** has had mixed reviews. Early versions of the portal were criticized for not being very user-friendly or for having technical glitches during peak periods (like deadlines for tax filing). The government and its private partners have iteratively improved the UI and system stability. Importantly, Ghana's approach to user adoption included stakeholder engagement: they conducted user education workshops and partnered with banks and mobile operators to promote the platform. Still, as of 2022 many citizens continued to use informal middlemen or "goro boys" (as locally known) for processes like vehicle registration, either out of habit or lack of trust in doing it themselves online. This underscores that **user trust** and cultural change take time. Afrobarometer data in Ghana (2019) showed only 32% of respondents felt government was handling improving basic health services well, and similar dissatisfaction in other services – while not directly about e-gov, it indicates a baseline of skepticism that digital methods must overcome. On the flip side, Ghana has active civil society groups and tech communities who have applauded the government's move to digital, indicating a normative shift that government *should* be digital. The ease of use will likely further increase as Ghana deepens its national ID (the Ghana Card) integration with e-services, enabling auto-filling of personal data and verification – steps that are underway and expected to simplify online interactions.

Institutional Factors: Ghana's case is particularly illustrative of **institutional arrangements via PPP**. By using a Design-Finance-Build-Operate-Transfer (DFBOT) model (Africa Capital Fund, 2025),

Ghana leveraged private expertise and capital, while the government provided policy support and partial financing (World Bank and government funds). This arrangement allocated risks: the private operator invested in modern data centers and software, bearing development risk, while the government guaranteed usage (for example, by mandating agencies to channel payments through Ghana.gov, providing a revenue stream to the operator)(Africa Capital Fund, 2025). A World Bank review hailed this PPP as one of Ghana's most successful, citing clear scope and stakeholder engagement as success factors (Africa Capital Fund, 2025). This underscores that **political commitment** was present: the government recognized its internal capacity limits and enlisted external help to meet public goals. However, PPPs also require good governance to avoid pitfalls – issues of transparency in contracting and data ownership had to be managed. Ghana enacted laws to empower its National Information Technology Agency (NITA) and Data Protection Commission, ensuring oversight of digital services and data security (World Bank, 2022). One institutional challenge in Ghana was **coordination among agencies**: as of 2022, not all ministries were fully integrated into Ghana.gov, with some legacy systems still operating in parallel. The fragmentation is being addressed by a new interoperability initiative (Ghana's data exchange hub), but in its absence, Ghana.gov had to custom-integrate each agency one by one (DIA, 2024).. Culturally, Ghana's public service is somewhat traditional and officials initially hesitated to trust an externally built system. Strong leadership from the Office of the Vice President (who championed digitization) helped push adoption. Ghana's relatively robust democracy also means there is an emphasis on **inclusion and rights** – for instance, there have been discussions about making the platforms accessible to persons with disabilities, and ensuring services are available in multiple languages. Ethically, Ghana has confronted issues of **digital exclusion**: much like elsewhere, rural and poorer citizens risk being left behind. The government's response includes maintaining alternative channels for some time (you can still apply in person if needed) and investing in community ICT centers.

In essence, Ghana's Ghana.gov showcases a model where **strategic partnerships** and focus on digital finance can drive e-governance, achieving quick wins in revenue and efficiency, but requiring continuous effort to bring all agencies and citizens on board. It also highlights the importance of building trust in new systems and reinforcing institutional capacities (regulatory and technical) to sustain the digital platform beyond the initial private sector involvement.

4.4 Cross-Case Analysis: Explaining Differences and Similarities

Having detailed each case, we now compare them directly to address the research questions. Table 2 below summarizes key comparative indicators for quick reference. Here, we discuss patterns in effectiveness (RQ1) and explanatory factors (RQ2), integrating theoretical insights and noting ethical considerations.

Indicator	Rwanda – Irembo	Kenya – eCitizen	Ghana – Ghana.gov

Launch year & model	2015; 25-year public-private concession with Irembo Ltd	2014; government-run portal complemented by Huduma Centres	2020 launch (development began 2018); Design-Finance-Build-Operate-Transfer PPP
Services online	≈ 98 public services available (2020)	> 5 000 services accessible (2023)	30 + agencies onboarded in phase 1
Usage statistics	> 2.7 million transactions processed (by 2022)	≈ 12–13 million registered users	+ 592 000 new taxpayers brought into the net
Integration design	Single-window portal; 20 + ministries/agencies; central e-payment engine; nationwide Irembo agent network	Unified payment gateway (M-Pesa); web & mobile portal linked to 50 + Huduma Centres for assisted access	Central payments engine triggers agency workflows; services integrated gradually; full interoperability still in progress
Stakeholder / management	Strong central coordination; PPP operator maintains platform under government oversight	ICT Authority leads; line ministries & county offices onboarded in stages; physical service-centre partnership model	PPP consortium builds & operates; National Information Technology Agency regulates and monitors
Notable outcomes	Petty-bribe rate down 23.9 % → 2.1 % (2017-24); CPI +8 points; OSI 0.7935; "High-EGDI" status achieved	Passport turnaround −50 %; business registration weeks → days; 300 % spike in government digital payments in Q3 2023	~100 % financial-inclusion metric; business registration cut from ≈ 2 weeks to 3 days
Persistent challenges	Rural connectivity gap (TII 0.321); digital-literacy dependence on agents	Rural inclusion & county-level fragmentation; occasional system outages	Incomplete ministry coverage; slower uptake in some rural areas; lingering trust issues

Table 2. Comparative indicators for the national e-governance platforms in Rwanda, Kenya, and Ghana (2015 – 2024).

Effectiveness in Service Delivery (RQ1): All three countries demonstrate that e-governance **can** improve public service delivery, but the degree and dimensions of improvement vary:

(i). **Efficiency and Speed:** In Rwanda and Ghana, specific services saw dramatic reductions in processing times (e.g., business registrations down to days) (African Capital Fund, 2025). Kenya also saw efficiency gains, but Kenya's biggest impact might be scale – serving millions of transactions quickly. Across all three, digitization generally reduced citizen time and travel burden (an often-cited metric: person-hours saved). However, one must caution that not every service was uniformly improved; some complex services (like land transfers or court services) remain slow even if partially digitized, showing the limits of technology when underlying processes are cumbersome.

(ii). **Transparency and Accountability:** Consistent with NPM's results-orientation and TAM's 'perceived usefulness' dimension, each platform has contributed to transparency by cutting intermediaries and cash handling. Rwanda explicitly links Irembo to its anti-corruption drive, and indeed studies credit Irembo with helping Rwanda achieve one of Africa's lowest corruption levels (Vota, 2024). Kenya's eCitizen similarly reduced petty corruption for things like permit approvals, though corruption has not been eradicated (it can shift to higher-level graft, which tech alone cannot fix). Ghana's system likely had the most direct anti-corruption effect in revenue collection – by automating payments, it sealed leakages that were known in tax collection. Transparency is also enhanced by **tracking features**: eCitizen and Ghana.gov let users see the status of applications, reducing information asymmetry that officials could exploit previously. In Rwanda, high transparency is more assumed due to trust in government, but the digital audit trails indeed provide accountability internally (UNDESA, 2022; eGKH, 2025). Notably, all three countries have moved up in international governance rankings in the past decade, suggesting some correlation with reforms including e-governance (for example, Rwanda and Kenya improved in the Ibrahim Index of African Governance, which may partly reflect service delivery improvements).

(iii). **Accessibility and Inclusion:** Here differences are sharp. Rwanda's model, while effective for those who can access it, faced the biggest rural access challenge due to lower internet penetration. However, Rwanda's use of offline agents is a mitigating strategy worth replication. Kenya, with mid-level internet penetration, did well by leveraging widespread mobile phone usage and supplementing with Huduma centers (Vota, 2024). Ghana, having the highest internet penetration, might seem best poised for inclusion, but urban-rural and income gaps still manifest; Ghana has invested less in physical one-stop centers compared to Kenya, potentially leaving some rural users dependent on internet cafes or not using e-services at all. A key measure of inclusion is what percent of adult population has used an e-government service. Rough estimates (combining user counts with population data) suggest Kenya might actually lead in this (given ~13 million users, possibly ~30% of adults), whereas Rwanda's usage is perhaps 15-20% of adults (given many transactions but likely repeat urban users), and Ghana's somewhere in between. This is an area where more data is needed, but qualitatively, Kenya's integrative approach seems to have driven broad uptake faster.

(iv). **Citizen Satisfaction and Trust:** Effectiveness ultimately reflects in whether citizens feel services improved. Afrobarometer surveys provide proxies: e.g., in Kenya, trust in the national government to deliver services increased between 2014 and 2019, and some analysts link this to visible initiatives like Huduma (Afrobarometer, 2019). In Rwanda, citizens consistently report high satisfaction

with government services in official surveys (though independent data is limited) – Irembo's efficiency likely reinforces that, albeit under a context of high baseline trust. Ghana has historically had more criticism of government services; the improvements via digitization may not yet be widely felt enough to drastically shift public opinion, given that even in 2022 half of Ghanaians rated government performance in basic services poorly (Afrobarometer, 2022). This suggests that e-governance is a necessary but not sufficient condition for citizen satisfaction; other factors (like overall service availability or economic conditions) play roles.

In summary, all three show **positive effectiveness in efficiency and transparency**, with some gains in accessibility, but **varying success in broad-based satisfaction**. Notably, none of the countries have fully solved the last-mile issues of inclusion or eliminated all governance problems – reminding us that technology is an enabler, not a panacea.

Explaining Variance (RQ2): Why have the outcomes differed? Several **enabling factors** and **constraints** emerge, mapped to our conceptual framework:

(i). **Policy Design and Leadership:** Rwanda's top-down, visionary policy design (with coercive enforcement) ensured swift rollout and compliance – a big enabler. Kenya had strong political leadership but a more decentralized polity, meaning persuasion and coordination were as important as command; this led to a more gradual integration but also perhaps more resilience (as many stakeholders took ownership). Ghana's design via PPP meant clear objectives (revenue, specific services) but somewhat narrow initial scope; it excelled in those domains but took longer to branch out to all services. The **commitment level** from leadership in all three was high, but the style differed: authoritarian drive vs. consensus and collaboration vs. contractual governance. Those styles influenced speed and breadth: Rwanda fastest in digitizing many services, Kenya broad in uptake and innovation like Huduma, Ghana strongest in a focused financial inclusion approach.

(ii). **Infrastructure & Digital Readiness:** Kenya and Ghana started with better telecom infrastructure (internet and mobile) than Rwanda, which explains why Rwanda had to rely more on offline workarounds despite great software. Ghana's higher internet use gave it potential for mass adoption, but interestingly Kenya achieved a lot with slightly lower internet penetration, likely due to excellent mobile integration and earlier start. **Electricity and connectivity** in rural areas remain challenges especially in Rwanda (though improving). Additionally, human capital (digital skills) is a differentiator: Ghana's relatively higher education levels and English language prevalence may give it an edge in the long run for adoption, whereas Rwanda had to also overcome language issues (introducing Kinyarwanda content, etc.) and lower baseline ICT skills. These factors echo the EGDI component scores: Rwanda's HCI and TII were lowest (UNDESA, 2022), matching its greater inclusion challenge, whereas Ghana's were higher, matching its better infrastructure but perhaps underperformance relative to that potential until recently.

(iii). **Institutional Coordination and Capacity:** Ghana had multiple ICT agencies and initially fragmented efforts (e.g., separate platforms in some ministries) that needed unification (eGKH, 2025). The Ghana.gov PPP cut through some silos by providing a central solution everyone was asked to use. In Kenya, creation of ICT Authority and the eGovernment Directorate helped centralize standards, but county-level integration is still a work in progress – the decentralization means variance in capacity across counties. Rwanda had the advantage of a unitary system with strong central capacity; RISA and affiliated bodies ensured one strategy across the board. However, one could argue Rwanda's lower administrative pluralism made it easier to implement but may stifle bottom-up feedback from agencies. On capacity, all three faced shortages of ICT talent in government. Kenya and Ghana mitigated this through partnerships with local tech companies and by tapping into vibrant private sectors (Kenya's developers community contributed to some solutions, Ghana's fintech companies built the platform). Rwanda, given its small private sector, built capacity internally and via foreign advisors/donors. Where capacity was high (e.g., Kenya's ICT Authority had skilled staff), implementation moved smoothly; where not, delays occurred (as seen in some Ghana agencies with weak IT units struggling to connect to Ghana.gov).

(iv). **User-Centric Design and Cultural Factors:** TAM perspective shows Kenya did well by focusing on user convenience (mobile money, Huduma centers for ease) – this cultural alignment was key. Rwanda's platform design was more government-centric initially (digitize what government wants) but has shifted to be more citizen-centric (iterating based on feedback, adding SMS notifications, etc.). Ghana took a finance-centric design (focusing on payments) which, while effective for revenue, might not immediately excite citizens beyond the context of paying fees. Culture of technology adoption also differs: Kenyans have a reputation for early adoption of tech (e.g., widespread use of mobile banking), which likely made them more eager e-service users. Ghana's culture is a bit more cautious (e.g., cash is still preferred by some despite mobile money growth), perhaps slowing eGov uptake. Rwanda's culture, shaped by government campaigns, is one where citizens follow official instructions, which helped adoption of Irembo when mandated, but perhaps with less organic enthusiasm initially. Over time, though, as people see benefits, genuine acceptance grows.

(v). **Ethical and Equity Considerations:** Variance also stems from how each country addressed ethical issues like inclusion and privacy. Rwanda strongly targeted **digital inclusion** with initiatives for devices and internet for the poor (UNDESA, 2022). Kenya focused on physical inclusion via Huduma and is now exploring community network initiatives for rural internet. Ghana's approach to inclusion was more through financial inclusion (everyone can pay via mobile money) – effective in one sense, but maybe overlooking non-financial barriers. On privacy, all three now have data protection laws (Ghana in 2012, Kenya 2019, Rwanda 2021) – Ghana was ahead, which might help trust. However, enforcement is nascent. Any privacy breach or misuse of data (not yet reported significantly in these cases) could affect citizen trust differently depending on how much they trust their institutions. Rwanda's trust in government might make people less concerned about privacy but also less aware of rights; Kenyans and Ghanaians, with freer media, might be more vocal if privacy or surveillance concerns arise, which would pressure improvements.

In explaining differences, **Institutional Theory** is particularly useful: it shows that Rwanda's coercive and normative environment pushed digital governance rapidly (with the risk of leaving some behind); Kenya's more mimetic and normative pressures (learning from private sector, citizen demand for convenience) yielded an entrepreneurial approach; Ghana's blend of coercive (mandates to use Ghana.gov) and normative (creating a PPP norm that government can partner with tech firms) provided a structured but narrower path initially. The extent of **isomorphic change** – whether agencies truly internalized new digital norms – may be highest in Rwanda (where it's mandated) and still variable in Kenya/Ghana (where some old habits persist in pockets). Thus, variance in outcomes (like Rwanda excelling in OSI vs Ghana in TII) can be traced to these institutional and cultural differences.

Ethical Considerations: It's important to note some cross-cutting ethical issues: **digital inclusion** (already discussed) and **administrative justice**. A risk in all cases is that those not online might be left with deteriorating in-person services or complexities. Governments must ensure e-governance does not inadvertently deepen inequality – so far, mitigations like Huduma and Irembo agents are promising practices to replicate. Another issue is **data privacy and cybersecurity**: as services move online, protecting citizen data is paramount. Kenya did face a breach in 2020 when a government database (not eCitizen itself but another) leaked, which raised alarms. Rwanda and Ghana have thus far avoided major incidents, but continue to invest in cyber defenses and encryption. **Accountability** is also ethical: e-systems can produce algorithmic biases or errors (e.g., an automated approval might wrongly reject someone). Ensuring there are grievance redress mechanisms (like help lines, the ability to appeal an e-service decision) is critical. Our analysis finds that all three countries are still developing these – Kenya's Huduma secretariat monitors feedback and has escalation for unresolved issues; Rwanda has a government 311 hotline where one can complain if Irembo fails; Ghana set up a call center for Ghana.gov queries. These measures need strengthening as reliance on e-services grows.

Theoretical Insights Summarized: NPM explains much of the drive (they all sought efficiency and did achieve it to varying extents, with Rwanda and Ghana showing clear performance improvements in specific sectors). TAM explains adoption differences – Kenyan citizens used eCitizen in droves because it was easy (mobile, one-stop), whereas Rwandan citizens needed more help initially (hence agents) due to access issues, and Ghanaian citizens used it where it clearly made life easier (like paying taxes) but might not yet for all services until usability improves. Institutional theory elucidates how governance structures and norms shaped these trajectories – a strong state imperative in Rwanda, a collaborative but also fragmented environment in Kenya, and a hybrid approach in Ghana. In all, the success of e-governance appears to require a **synthesis of these elements**: political will (NPM's focus), user-centered design (TAM's lesson), and supportive institutions (Institutional theory's domain). If any of these is lacking, results are weaker. For example, lacking user-centricity (TAM) can lead to low uptake even if tech is available – which could have been Ghana's issue if they didn't improve UI; lacking institutional support can cause projects to stall (some other African countries have fancy portals that hardly anyone in government uses, leading to failure – not the case in our three thanks to solid institutional backing).

Finally, reflecting on **broader implications for pan-African digital governance frameworks (RQ3)** – our comparative study shows that while context matters immensely, certain universal principles hold: invest in infrastructure and digital skills as foundational, design with the citizen in mind (including the poorest and least tech-savvy citizen), secure high-level political backing and interagency coordination to drive adoption, and ensure proper legal frameworks for data and process integration. These insights inform the recommendations in the next section, which propose how other countries or the continent collectively might emulate or adapt the successes of Rwanda, Kenya, and Ghana while avoiding their pitfalls.

5. Conclusion & Recommendations

The comparative analysis of e-governance in Rwanda, Kenya, and Ghana yields several **enduring insights** and strategic recommendations for policymakers, practitioners, and stakeholders across Africa. In conclusion, we synthesize the key takeaways and offer a multi-stakeholder implementation blueprint to guide sustainable digital governance through 2035.

5.1. Key Takeaways: First, political commitment at the highest levels emerges as a **necessary catalyst** for e-governance success – all three cases benefited from strong leadership and clear digital transformation visions. However, political will by itself is **insufficient** without complementary investments in citizen-centric design and local capacity-building. Rwanda's example shows that even an authoritative push can only go so far if citizens lack access or skills; Kenya and Ghana show that engaging users and building trust are equally critical. Second, institutional design significantly affects outcomes: a centralized one-stop model (Rwanda) can speed up integration but must be paired with inclusion measures, whereas a decentralized approach (Kenya) can foster innovation and adaptability but needs coordination mechanisms to avoid fragmentation (eGKH, 2025). Ghana's PPP model underscores that leveraging private sector efficiency is viable, but governments must maintain ownership of public values (equity, accountability). Third, **digital inclusion is paramount** – all the efficiency gains ring hollow if large segments of the population are left out. Bridging the rural-urban digital divide (through infrastructure expansion and analog complements like service centers) is both an ethical imperative and a practical one for maximizing platform usage (WEF, 2020; eGKH, 2025). Fourth, e-governance is not a one-off project but a continuous journey of evolution. Technology changes (e.g., rise of smartphones, AI) and user expectations will grow, so systems must be agile, scalable, and continuously improved. Finally, context matters: there is no one-size-fits-all model. What works in a small, centralized country may need adaptation in a large federal country. Thus, policy transfer should be guided by local context analysis.

5.2. Recommendations: Based on the findings, we propose a multi-stakeholder implementation matrix (Table 3) outlining roles and actions for key actors – governments, donors/development partners, private sector, and civil society – to collaboratively advance digital public services.

Key actor	Strategic role	Priority actions (indicative)

National Governments	Policy leader and systems steward	[1] Sustain investment in broadband, electricity, devices, and civil-service ICT up-skilling; [2] Apply **citizen-centric design** (local-language, mobile-first interfaces, continuous user-feedback loops, alternative offline channels); [3] Enact and enforce interoperability mandates, e-transaction legality, and strong data-protection regimes; empower a central CIO/agency while delegating day-to-day platform management to trained line ministries and local governments.
Donors & Development Partners	Catalyst and capacity builder	[1] Finance backbone infrastructure and public-sector digital-skills programmes; [2] Convene peer-learning networks (Smart Africa, AU working groups) and fund staff exchanges/case-study dissemination; [3] Support agile pilot projects and sandbox regulation for AI, chatbots, blockchain and other emerging technologies.
Private Sector (tech, telecoms, finance)	Innovator, solution provider and co-investor	[1] Deliver **open, interoperable systems** and avoid vendor lock-in through full documentation and co-development with government IT teams; [2] Tailor services to local constraints (offline functionality, voice interfaces, mobile-money payments, context-specific cybersecurity); [3] Pursue CSR by sponsoring digital-literacy drives, zero-rating government portals, equipping community ICT hubs, and feeding user-experience data back to policy-makers.
Civil Society & Academia	Accountability watchdog and knowledge multiplier	[1] Track inclusion, gender gaps and privacy through public score-cards; [2] Run grassroots digital-literacy and rights-awareness campaigns; [3] Conduct independent impact evaluations and convene multi-stakeholder forums that keep reforms transparent and politically resilient.

Table 3: Multi-stakeholder implementation matrix for advancing digital public services in Africa. **The matrix synthesises the comparative evidence from Rwanda, Kenya and Ghana; roles and actions should be tailored to national contexts.*

Below we summarize the core recommendations for each:

(i). National Governments:

(a). Invest in Digital Foundations: Prioritize spending on ICT infrastructure (broadband networks, electricity, devices for public institutions) and human capital (training civil servants in ICT, digital literacy programs for citizens). Governments should allocate a consistent percentage of the budget to maintain and upgrade e-government systems (to avoid stagnation once donor funding ends). For example, governments can emulate Rwanda's device subsidy initiatives or Kenya's community network pilots to extend internet access.

(b). **Citizen-Centric Design:** Adopt a user-centered approach in developing e-service platforms. This means conducting user research, simplifying interfaces, offering services in local languages, and optimizing for mobile devices (given the prevalence of mobile internet in Africa). Governments should implement **feedback loops** – e.g., in-app service ratings, periodic user satisfaction surveys – and use that data to refine services (eGKH, 2025). Additionally, maintain alternative access channels like integrated service centers or call centers to assist those who cannot go fully digital, ensuring no one is left behind.

(c) **Policy and Regulatory Frameworks:** Enact supportive laws, such as those mandating interoperability and data sharing among agencies (breaking silos), e-transaction legality, and data protection laws to safeguard privacy (building trust). Establish or empower a central e-government coordinating agency (or a Chief Information Officer at cabinet level) to enforce standards and lead implementation (eGKH, 2025). Also, decentralize platform management in a controlled way: train and authorize local governments or departments to update and manage their e-services within the unified platform, thus increasing buy-in and relevance at local levels.

(ii). Donors and International Development Partners:

(a). Fund Infrastructure and Capacity Development: Donors (World Bank, African Development Bank, bilateral aid agencies) should continue financing critical ICT infrastructure projects (national fiber backbones, government data centers) and capacity-building initiatives (e.g., training programs for digital skills in the civil service). These investments yield high public sector dividends. Grants or soft loans can target countries lagging in digital government to replicate proven solutions. Importantly, aid should support not just "hard" infrastructure but also the **soft infrastructure** of governance: helping countries develop enterprise architecture, legal frameworks, and evaluation tools for e-government.

(b). **Promote Knowledge Sharing:** Facilitate platforms for African countries to share experiences, perhaps under the Smart Africa Alliance or AU's e-government working groups. Donors can sponsor peer learning workshops, staff exchanges (e.g., ICT authority of one country helping another), and case study publications. By disseminating best practices (like Huduma centers or PPP structures), development partners accelerate collective learning.

(c). **Support Agile and Innovative Approaches:** Encourage governments to experiment with emerging technologies (like chatbots for service info, AI for translating local languages, blockchain for records) through pilot projects and sandbox regulatory environments. Fund small-scale innovation grants or challenges that engage local tech start-ups to develop e-government solutions (for instance, apps to improve accessibility for disabled citizens). Ensure that these innovations are evaluated and, if successful, scaled up within government systems.

(iii). **Private Sector (Tech Companies, Telecoms, Finance):**

(a). Build Interoperable Systems: Private tech companies involved in government contracts

should adhere to open standards and ensure systems are interoperable and transferable. Governments must avoid vendor lock-in; hence private providers should work closely with government IT teams and document systems thoroughly for longevity.

(b). **Innovate for Local Needs:** The private sector should leverage its expertise to create solutions tailored for African contexts – e.g., offline functionality for areas with intermittent internet, voice-based services for illiterate users, integration of mobile money as default payment, and robust cybersecurity tailored to evolving threats. The Ghana.gov PPP success suggests that aligning profit motive with public value (through well-structured contracts and performance incentives) can spur innovation. Companies can propose **software leasing or transaction fee models** that reduce upfront costs for government while ensuring quality (as done in Ghana's case) (Africa Capital Fund, 2025).

(c). **Corporate Social Responsibility (CSR):** Telecom and fintech firms, which benefit from digital government through increased usage, can contribute via CSR – supporting digital literacy campaigns, sponsoring free or discounted internet access for e-government sites (zero-rating government websites, for instance), or helping equip community digital centers. Public-private dialogue is also key: businesses as users of government services (for permits, registrations) should provide feedback to improve efficiency and transparency, reinforcing a virtuous cycle.

(iv). Civil Society and Academia:

(a). Monitor Equity and Accountability: Civil society organizations (CSOs) should watchdog e-governance rollouts to ensure they uphold principles of inclusion and accountability. For example, CSOs can track whether rural areas are receiving needed support, whether women and marginalized groups have equal access (since digital gender divide can be an issue), and whether data privacy is respected. They can publish scorecards or report cards on e-service performance from a citizen perspective, keeping governments accountable to user needs.

(b). **Public Digital Literacy and Advocacy:** CSOs can run digital literacy drives at the grassroots, teaching citizens how to securely use e-services and what their rights are in digital governance. Additionally, they should advocate for the digitally excluded – pushing governments to maintain service alternatives or improve accessibility. Academia can contribute through research on e-governance impact, which informs policymakers of what works and what doesn't. Research institutions should be engaged in **impact evaluations** of e-government projects (did corruption levels change? did service delivery outcomes improve health or education metrics?), providing independent evidence to justify or recalibrate investments.

(c). **Multi-stakeholder Forums:** Civil society, in partnership with government and private sector, should support forums (national digital councils, for instance) where all stakeholders including citizen representatives discuss the direction of e-governance. This ensures transparency in how these programs

evolve and builds broad ownership, which is especially important in democracies to avoid political discontinuities affecting progress.

From a multi-level governance (MLG) perspective, the three cases reveal a substitution effect: strong top-down coercive mandates can compensate for limited digital infrastructure and still lift service quality while national internet penetration remains below roughly 40 percent—the continental average today (Signé, 2023). Once that diffusion threshold is crossed, however, performance hinges on horizontally coordinated, citizen-driven mechanisms that echo Hooghe and Marks' Type II governance logic, as evidenced by Kenya's and Ghana's trajectories (Hooghe & Marks, 2001; UNDESA, 2022). By implementing these recommendations, countries can work toward a **replicable yet adaptable e-governance framework**. For lower-income countries with limited resources, a phased approach is advised: start with a few high-impact services (as Ghana did with revenue-related ones), demonstrate success, then expand; concurrently build the backend foundations (unique IDs, interoperability frameworks) for scalability. A key principle is balancing **ambition with capacity** – set bold goals (e.g., "digital everything by 2030") to galvanize action, but ground them in realistic assessments of infrastructure and skills, and include risk mitigation (like fallback options if systems fail).

In conclusion, the comparative study affirms that effective e-governance in Africa is achievable when **technology deployment is paired with governance reform**. Digital tools can indeed catalyze more transparent, efficient, and responsive public services – the very tenets of good governance – but they must be embedded in inclusive policies and robust institutions. As Rwanda, Kenya, and Ghana continue to refine their systems, their experiences offer valuable lessons for the rest of the continent. The next decade will be pivotal as nations implement the African Union's Digital Transformation Strategy (2020–2030) (Diplo Foundation, 2023; AU, 2020); the recommendations above provide a blueprint to ensure that by 2035, digital governance in Africa is not just cutting-edge in technology, but also a model of **equitable and citizen-centered public administration**.

5.3. Future Research & Continental Foresight: Building on this study, future research should delve deeper into emerging questions and long-term scenarios in Africa's e-governance evolution. We identify three promising research avenues and outline a 10–15 year foresight for digital governance on the continent:

(i). Longitudinal Studies on Digital Trust and Citizen Engagement: While our study provided a cross-sectional comparison, there is a need for longitudinal research tracking how citizen trust in government and patterns of civic engagement change as e-governance matures. For example, do citizens become more satisfied and trusting of government over a decade of digital service improvements, or do unmet expectations lead to backlash? Long-term surveys and case studies, especially in countries where e-gov has been around for a while (e.g., Mauritius, South Africa, in addition to our cases), could reveal the social and political impacts of e-governance. Researchers should also examine whether digital channels (like online portals or social media) open up new avenues for citizen **participation** and feedback in governance beyond service transactions – aligning with the concept of e-participation. These studies

will inform how to sustain public support for digital reforms and how e-governance can strengthen democracy (or potentially, in some contexts, be used for state surveillance – thus requiring vigilance).

(ii). AI-Powered Public Service Interfaces in Low-Resource Contexts: With advances in artificial intelligence, there is vast potential (and hype) around AI in government. Future research can pilot and evaluate **AI-driven interfaces** – for instance, chatbots that guide users through service applications in local languages (using natural language processing), or AI systems that triage and respond to citizen inquiries (like a virtual assistant for government services). Low-resource contexts pose challenges (limited training data, language diversity, lower digital literacy to interact with AI), so research should focus on adapting AI to be inclusive and reliable in these settings. A relevant exploration is how AI might personalize services: could machine learning analyze patterns to proactively deliver services (for example, pre-emptively enrolling citizens in programs they qualify for, akin to "intelligent government") and would citizens accept that? Pilot projects in Africa (such as AI chatbots used during COVID-19 for information dissemination) provide a starting point. Rigorous evaluation of their effectiveness and user satisfaction will be crucial before scaling AI in core services. This research ties into ethical questions of algorithmic bias and accountability – fertile ground for interdisciplinary work (tech + public policy scholars).

(c). E-Governance for Displaced or Stateless Populations: Africa faces significant mobility – refugees, internally displaced persons (IDPs), and cross-border communities. Future e-governance research should address how digital public services can be extended to populations who are often excluded from traditional governance frameworks. For instance, exploring **digital identity solutions** for refugees that multiple countries recognize (perhaps leveraging blockchain or international agreements) could allow displaced persons to access services (health, education) wherever they are, and maintain continuity of records. Another dimension is portable social benefits or qualifications – can e-governance help track and transfer, say, a refugee child's schooling records across borders? There are pilot initiatives like the World Food Programme's blockchain ID for aid, but more holistic e-gov approaches for stateless populations need research and development. This area intersects with humanitarian studies and international law; African scholars and regional bodies (like IGAD for the Horn of Africa) should be involved in crafting solutions that fit local contexts. As climate change may increase displacement, this research is forward-looking and essential for inclusive governance.

Continental Foresight (2035 horizon): Looking 10–15 years ahead, we envision several trends shaping Africa's digital governance:

(i). Blockchain for Identity and Secure Transactions: By 2035, many African nations could adopt blockchain or other distributed ledger technologies for key governance applications, notably **digital identity management** and land registries. A blockchain-based pan-African identity (perhaps aligned with the African Union's aspirations) might emerge, enabling verification of personhood across borders, reducing identity fraud, and empowering citizens with control over their data. This would facilitate not only easier access to services anywhere on the continent but also economic integration (e.g., easier Know-Your-Customer compliance for banking). Research and pilot programs (like in Sierra Leone for credit histories, or Ethiopia's trials for student records on blockchain) may pave the way. However,

technical and governance interoperability will be a hurdle – a likely scenario is regional blocks implementing compatible systems first.

(ii). AI for Adaptive Public Feedback Loops: By 2035, AI could be integral in analyzing citizen feedback at scale and **automatically adjusting service delivery**. For example, governments might deploy AI to analyze social media and service usage data in real-time to detect public grievances or service bottlenecks, creating an "adaptive feedback loop." If a certain service in one region shows low uptake, AI might flag it and suggest targeted outreach or interface tweaks. Additionally, AI-driven decision support systems could help policymakers simulate the impact of, say, adding a new e-service or changing a process (aligning with the concept of "digital twins" of government processes). Ethical AI frameworks will need to be in place to guard against misuse or erroneous conclusions, but the foresight suggests a shift from static e-services to **intelligent, learning e-governance ecosystems**.

(c). Continental Policy Harmonization and Integration: By 2035, propelled by initiatives like the African Continental Free Trade Area (AfCFTA) and Smart Africa Alliance, we anticipate much greater harmonization of digital policies and even interconnected e-government systems across countries (Diplo Foundation, 2023). This could mean mutual recognition of digital signatures and electronic documents across borders (e.g., a company registered in one country can use those e-documents to operate in another seamlessly), and regionally integrated platforms for certain services (imagine a West African portal for cross-border trade permits). The Smart Africa Manifesto's vision of a **Single Digital Market** will likely push countries to adopt interoperability standards (for data exchange, cybersecurity, etc.). A plausible development is African Regional Technical Standards for e-government, much like the European Union's frameworks, supported by bodies like AU's specialized agencies. While political unity in Africa is complex, digital integration might advance faster because of its economic rationale.

In forecasting these developments, a critical underlying factor will be **capacity development**: whether Africa can train and retain enough digital professionals (developers, data scientists, cybersecurity experts, IT project managers) within government and supporting sectors. Achieving the foresight scenario will require proactive efforts now in education (STEM emphasis, coding in schools) and reversing brain drain, possibly through initiatives of the African Diaspora contributing skills. International partnerships (e.g., with the EU, India, or China) for technology transfer will also shape the trajectory.

In conclusion, the horizon for African e-governance is both exciting and challenging. Groundbreaking innovations are on the way, but they must be managed within ethical, inclusive frameworks so that the **digital state of the future** empowers all citizens and strengthens governance. As this article has argued, the foundations being laid today in Rwanda, Kenya, Ghana and elsewhere are crucial steps. Continual research, adaptive policymaking, and multi-sector collaboration will ensure that by 2035, Africa's digital governance not only matches global best practices but offers new paradigms of its own, rooted in the continent's unique aspirations and values.

5.4. Limitations. This inquiry relies primarily on secondary data—policy documents, index scores, and administrative reports—whose self-reported nature may embed optimism bias and uneven data quality. Moreover, the absence of citizen–panel longitudinal data limits causal inference about how digital reforms shape lived experiences over time. Future research should therefore pair large-scale

transaction-log analytics with ethnographic observation and multi-wave citizen panels, generating a mixed-methods audit trail that can triangulate usage statistics with perceptions and equity outcomes.

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